Randomised controlled trial to evaluate early discharge scheme for patients with stroke

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Abstract

Objective: To assess the clinical effectiveness of an early discharge policy for patients with stroke by using a community based rehabilitation team.
Design: Randomised controlled trial to compare conventional care with an early discharge policy.
Setting: Two teaching hospitals in inner London.
Subjects: 331 medically stable patients with stroke (mean age 71) who lived alone and were able to transfer independently or who lived with a resident carer and were able to transfer with help.
Interventions: 167 patients received specialist community rehabilitation for up to 3 months after randomisation. 164 patients continued with conventional hospital and community care.
Main outcome measures: Barthel score at 12 months. Secondary outcomes measured impairment with motoricity index, minimental state examination, and Frenchay aphasia screening test; disability with the Rivermead activity of daily living scales, hospital anxiety and depression scale, and 5 m walk; handicap with the Nottingham health profile; carer stress with caregiver strain index and patient and carer satisfaction. The main process measure was length of stay after randomisation.
Results : One year after randomisation no significant differences in clinical outcomes were found apart from increased satisfaction with hospital care in the community therapy group. Length of stay after randomisation in the community therapy group was significantly reduced (12 *v* 18 days; $P < 0.0001$). Patients with impairments were more likely to receive treatment in the community therapy group.
Conclusions: Early discharge with specialist community rehabilitation after stroke is feasible, as clinically effective as conventional care, and acceptable to patients. Considerable reductions in use of hospital beds are achievable.

Introduction

Stroke accounts for the use of a fifth of acute medical beds and a quarter of long term beds.[1] In the United Kingdom up to 70% of patients are admitted to hospital in inner city districts,[2] with the mean length of stay varying from 11.0 to 38.9 days around Europe.[3] The cost to the NHS of acute stroke care has been estimated at £4626 per discharge,[4] with a prediction that the total costs of stroke care will rise in real terms by 30% between 1991 and 2010 because of the effects of an aging population.[5] Hospital and community care is often fragmented and haphazard,[6] despite there being clear evidence of the benefits of coordinated care.[7]

It has been argued that a more balanced approach to stroke care between hospital and community should be adopted.[8] Care in the community may be more acceptable to patients and gives the opportunity to deal with psychosocial issues and handicap.[9] Earlier discharge from hospital with rehabilitation provided at home may enable these to be handled more effectively than with conventional care and may provide the opportunity for financial savings.

By using a rehabilitation team in the community we evaluated the effect of early discharge compared with conventional care on disability at one year in patients who had been admitted to hospital after a stroke. The resource implications of this policy were also investigated. The trial was designed to be applicable to most patients with stroke admitted to a district general hospital. No attempt was made to avoid initial hospital admission because it was considered impracticable to establish appropriate packages of health and social care quickly enough to prevent admission for patients who often live alone in poor quality housing in this inner city district.

Patients and methods

Case ascertainment and entry criteria

A hospital based stroke register was maintained at St Thomas's and King's College Hospitals, London, between January 1993 and July 1995. The World Health Organisation's definition of stroke was used.[10] Twice weekly checks of the wards were undertaken by two dedicated research associates with nursing training. Patients were managed in the normal way until the criteria were fulfilled for entry into the trial. If patients lived alone they needed to be able to perform functional independent transfer, and if they lived with a willing carer they needed to be able to perform transfer with assistance. The point at which these criteria were met was decided after consultation with the hospital physiotherapist. All patients were assessed within one working day of notification by a consultant physician or at King's College Hospital by a medical registrar, who obtained informed consent from the patient or next of kin when the patient had cognitive impairment or dysphasia. Baseline data were collected

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after randomisation by a researcher blinded to which arm of the trial the patient was in. Ability to transfer did not necessarily imply that discharge could take place immediately. The rehabilitation team responsible for the patient was notified that the community team was available to provide care after discharge and it was left to the team to plan discharge whenever feasible. The study obtained approval from the local ethics committees. Patients were excluded if they lived too far away for the team to visit.

Randomisation

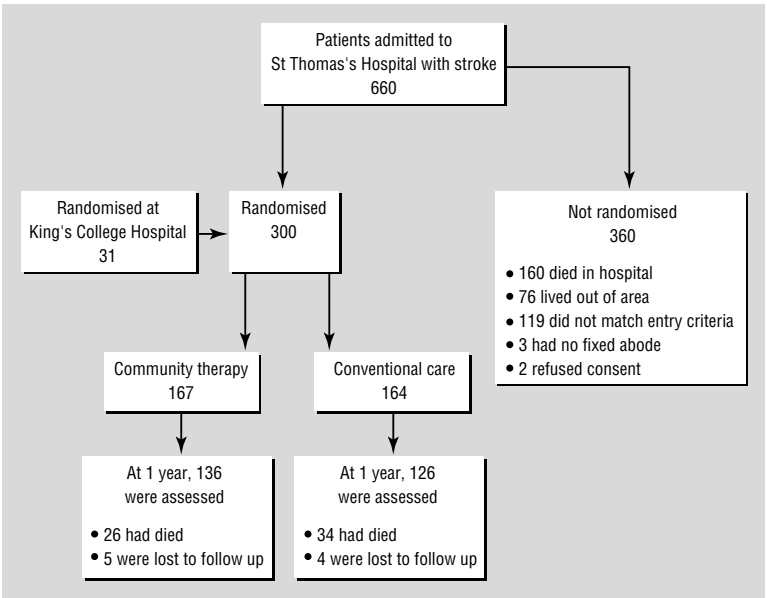
After consent randomisation was restricted in permuted blocks of 10 with random number tables provided in blank sealed opaque envelopes. Patients were allocated to continue conventional treatment or to receive community treatment. No stratification was performed.

Interventions

Patients allocated to conventional care continued with their treatment, discharge planning, and outpatient care in the normal way. Stroke care at both hospitals is similar and well coordinated. About half of the patients who are admitted receive treatment in a stroke unit, with the remainder being treated in general medical or elderly care wards. Outpatient resources available to them included a hospital based stroke clinic, geriatric day hospital, generic domiciliary physiotherapy and speech and language therapy, hospital outpatient physiotherapy, and the usual community resources. The maximum level of home care available in the study area to all patients was three one hour visits daily by a home help for personal care, meals on wheels, and community nurse visits for specific tasks.

Patients randomised to the community therapy team remained in hospital until the required package of social services care could be organised and any home adaptations undertaken. A store of commodes, high chairs, and toilet frames was kept by the team to expedite discharge. The patients were assessed for rehabilitation needs before discharge in conjunction with the hospital based therapists to set initial objectives and to ensure continuity of care. After discharge, patients were given a planned course of domiciliary physiotherapy, occupational therapy, and speech therapy, with visits as frequently as considered appropriate (maximum one daily visit from each therapist). Each patient had an individual care plan, which was reviewed at a weekly team meeting. Patients received care from the team for a maximum of three months. On discharge patients were referred to conventional services when appropriate. All other services apart from therapy were as described for the conventional group. There was no augmentation of social services resources.

The community therapy team comprised a senior physiotherapist grade 1 with neurological training, a senior occupational therapist grade 1, a half time speech and language therapist with adult neurological training, and a full time therapy aide. A consultant physician (AGR) coordinated the team and chaired the weekly clinical meeting.



Details of randomisation and outcome

Assessment of outcome

Baseline data on demography and severity of stroke were collected within 48 hours of randomisation. Two research associates conducted all the assessments at discharge and at 2, 4, and 6 months. A third research associate conducted the assessment at 12 months by interview, usually in the patient's home, and she was blind to the treatment group, although occasionally the patient did make clear which group they had been in. No evaluation of the efficacy of the blinding procedure was performed.

A range of standardised outcome assessments was used to measure aspects of impairment, disability, and handicap and could be completed in most cases in 45 minutes.[11]

Impairments were assessed with the following tests.

Motoricity index, which is a measure of limb function with a maximum score of 100 for normal subjects. Severe paralysis is defined as a score of 0-32, moderate as 33-64, and mild as 65-99.

Minimental state examination—Severe cognitive impairment is defined as a score of 23 or less out of a total of 30.

Frenchay aphasia screening test is a screening instrument to detect aphasia in patients with stroke. A score of 13 or less out of 20 indicates aphasia.

Disability was measured with the following tests.

Modified Barthel score—To try to overcome the recognised differences between the intervals at the lower, middle, and upper ends of the scale, analysis was also performed by dividing the scale into 0-14 (severe disability), 15-19 (moderate disability), and 20.

Rivermead activities of daily living score has been validated for use in elderly patients with stroke. Scores range from 15-45, with 15 indicating dependence in all measured activities.

Hospital anxiety and depression scale is a 21 point scale, with a cut off point of greater than 10 identifying those with a high probability of the disorder and 8-10 being borderline. It is designed for self assessment, creating problems for those with language, cognitive, and concentration problems.

The 5 metre timed walk—In a trial of late physiotherapy after stroke Wade et al used a 10 metre walk,[12] suggesting gait speed offers a simple and

Table 1 Baseline comparisons between groups of patients with stroke according to place of rehabilitation. Values are numbers (percentages) of patients unless stated otherwise

Variable	Community therapy (n=167)	Conventional (n=164)
Sex:		
Male	92 (55)	93 (57)
Female	75 (45)	71 (43)
Age (years):		
Mean (SD)	70 (11)	72 (12)
Median (range)	70 (27-96)	73 (42-103)
Ethnic group:		
White	124 (74)	122 (74)
Black Caribbean	26 (16)	28 (17)
Black African	10 (6)	4 (2)
Other	7 (4)	10 (6)
Recurrent stroke	2 (1)	2 (1)
Previous Barthel score:		
0-14	12 (7)	8 (5)
15-19	29 (17)	41 (25)
20	126 (75)	115 (70)
Length of stay to randomisation (days):		
Mean (SD)	22 (25)	25 (30)
Median (range)	13 (1-127)	13 (0-30)
Not known	1	0
Living conditions before stroke:		
Living alone	51 (31)	62 (38)
Living with another person	104 (62)	87 (53)
Institution/other	12 (8)	15 (9)
Barthel score at randomisation:		
0-14	70 (42)	65 (40)
15-19	78 (47)	78 (48)
20	17 (10)	20 (12)
Not known	2	1
Dysphasia	68 (42)	57 (35)
Incontinence	47 (29)	46 (29)

sensitive measure of outcome. For many housebound patients 10 metres was impracticable, and 5 metres was therefore substituted.

Nottingham health profile was used to assess subjective health status across six domains: energy, pain, emotion, sleep, social, and physical mobility. The maximum total score is 45, with a high score indicating poor health status.

Caregiver strain index measured carers' stress, the index having 13 items. Overall stress score was obtained by summing the subjects' ratings across all the items.

Patient and carer satisfaction was assessed by using stroke specific questionnaires. Analysis was performed separately for questions relating to hospital care, rehabilitation, and home care.

To evaluate the differences in utilisation of services, length of stay, number of therapy sessions with one unit being defined as a 20 minute session per therapist, hospital readmission, and living conditions on discharge and at one year were documented.

Statistical analyses

The associations between the normally distributed continuous variables and treatment group were examined by using the unpaired *t* test. When the continuous variables showed evidence of a non-normal distribution, the Mann-Whitney test was used and the confidence interval calculated for the difference between medians. The χ^2 test was used to investigate the associations between the categorical variables and the treatment group. For ordered categorical variables the χ^2 test for trend was used. The sample size of 130 per group at one year has a power of 80% at the 5% level of detection for a 3.5 point difference in Barthel score based on a standard deviation of 10.

Results

Randomisation was between 27 January 1993 and 19 July 1995. Of 660 patients with stroke admitted to St Thomas's Hospital, 300 were randomly allocated treatment (figure). Two refused to participate. Of the 358 who were not randomly allocated treatment, 160 died in hospital, 76 lived out of the area, 3 were of no fixed abode, and 119 failed to meet the entry criteria by never achieving independent functional transfers. At King's College Hospital 31 patients were randomly allocated treatment.

Table 1 describes the baseline characteristics assessed on admission. There were no significant

Table 2 Outcome assessments at discharge from hospital of patients with stroke according to place of rehabilitation

Detail	Community therapy (n=167)	Conventional (n=164)	P value	95% CI for difference between groups
Barthel activities of daily living				
Mean (SD)	15 (4)	15 (4)		
Median (range)	16 (1-20)	15 (4-20)	0.94*	(–1 to 1)
Not known	2	0		
Frenchay aphasia				
Mean (SD)	18 (8.4)	19 (8.3)	0.92†	(–2.0 to 1.9)
Median (range)	21 (0-20)	21 (0-30)		
Not assessed	20	23		
Hospital anxiety and depression scale				
No (%) with anxiety:				
Normal	89 (70)	106 (82)	0.02‡	
Borderline	18 (14)	14 (11)		
Abnormal	20 (16)	10 (8)		
Not assessed	40	34		
No (%) with depression:				
Normal	88 (70)	93 (73)	0.8‡	
Borderline	25 (20)	21 (16)		
Abnormal	13 (10)	14 (11)		
Not assessed	41	36		
Minimental state examination				
Mean (SD)	21 (7.1)	21 (7.3)	0.70†	(–1.2 to 2.1)
Median (range)	23 (0-30)	23 (0-30)		
Not assessed	27	23		
Motoricity				
Mean (SD)	83 (13)	85 (12)	0.15†	(–5.1 to 0.6)
Median (range)	87 (41-100)	86 (44-100)		
Not assessed	15	10		
Five metre timed walk				
Mean (SD) (secs)	15 (23)	17 (35)		
Median (range)	10 (4-180)	10 (5-360)	0.08*	(–2 to 0)
Not assessed	65	51		
Total Nottingham health profile				
Mean (SD)	11 (7)	10 (7)		
Median (range)	11 (0-37)	9 (0-31)	0.10*	(0 to 3)
Not assessed	32	33		
No (%) discharged from				
Acute medicine	53 (32)	49 (30)	0.65§	
Elderly care	15 (9)	12 (7)		
Stroke unit	78 (47)	87 (53)		
Other	21 (13)	16 (10)		

*Mann-Whitney test.
†Unpaired *t* test.
‡χ^2 test for trend.

Table 3 Outcome assessments 1 year after stroke according to place of rehabilitation

Detail	Community therapy (n=136)	Conventional (n=126)	P value	95% CI for difference between two groups
Barthel activities of daily living				
Mean (SD)	16 (4)	16 (4)		
Median (range)	18 (2-20)	18 (3-20)	0.30*	0 to 1
Not assessed	1	0		
No (%) with grouped Barthel score:				
0-14	30 (22)	35 (28)		
15-19	60 (44)	56 (44)	0.23†	
20	45 (33)	35 (28)		
Frenchay aphasia				
Mean (SD)	22 (8)	23 (7)	0.99‡	–2.5 to 1.6
Median (range)	25 (0-30)	26 (1-30)		
Not assessed	28	24		
Hospital anxiety and depression scale				
No (%) with anxiety:				
Normal	79 (69)	79 (81)	0.02†	
Borderline	16 (14)	12 (12)		
Abnormal	20 (17)	7 (7)		
Not assessed	21	28		
No (%) with depression:				
Normal	70 (61)	59 (60)	0.9†	
Borderline	20 (18)	19 (19)		
Abnormal	24 (21)	21 (21)		
Not assessed	22	27		
Minimental state examination				
Mean (SD)	25 (6)	25 (6)	0.86‡	–1.5 to 1.7
Median (range)	27 (8-30)	27 (5-30)		
Not assessed	20	20		
Motoricity				
Mean (SD)	88 (13)	87 (14)	0.80‡	–2.7 to 9
Median (range)	91 (36-100)	90 (21-100)		
Not assessed	5	1		
Five metre timed walk				
Mean (SD)	12 (6)	12 (8)		
Median (range)	10 (6-40)	9 (6-70)	0.34*	0 to 1
Not assessed	37	36		
Total Nottingham health profile				
Mean (SD)	14 (9)	12 (8)		
Median (range)	13 (0-42)	12 (0-36)	0.11*	0 to 4
Not assessed	18	21		
Rivermead activities of daily living scale				
Mean (SD)	27 (12)	27 (11)		
Median (range)	25 (15-45)	25 (15-45)	0.93*	–2 to 3
No (%) with score 15	28 (21)	28 (23)	0.71§	–12% to 8%
No (%) with score >15	104 (79)	93 (77)		
Not assessed	4	5		
Caregiver strain				
Mean (SD)	5 (4)	4 (3)		
Median (range)	5 (0-12)	3 (0-12)	0.14*	0 to 2
Not assesed	61	67		
No (%) of patients satisfied with				
Hospital care	78 (79)	59 (65)	0.032§	1% to 27%
Therapy provision	56 (58)	46 (51)	0.29§	–6% to 22%
Community support	44 (56)	35 (50)	0.44§	–10% to 22%
General	58 (59)	43 (48)	0.14§	–34% to 25%
No (%) of carers satisfied with				
Hospital care	60 (74)	41 (67)	0.37§	–8% to 22%
Therapy provision	40 (53)	28 (46)	0.39§	–9% to 24%
Community support	28 (42)	29 (51)	0.35§	–26% to 9%
General	68 (83)	52 (83)	0.95§	–12% to 13%

*Mann-Whitney test. †χ^2 test for trend. ‡Unpaired *t* test. §χ^2 test.

differences between the two arms of the trial. Table 2 shows outcome at discharge from hospital. For the Nottingham health profile the reasons for failing to complete the score were refusal (11 patients), cognitive impairment (11), aphasia (21), inability to speak English and problems with literacy (9), and death before assessment (5). The incidence of missing data was not significantly different between the groups. Reasons for failing to complete the hospital anxiety and depression scale and the Frenchay aphasia screening test were similar.

Table 3 describes the outcomes at one year. No significant differences between the two groups were found on any of the measures, including the individual scores on the Nottingham health profile subcategory. Patient satisfaction for the care given in hospital was greater in the community therapy group (P = 0.032).

Table 4 gives the number of patients lost to follow up, survival to one year, recurrence of stroke, and readmission rates. Five patients in the community therapy group were lost to follow up due to refusal to participate further and emigration. Four of the conventional treatment group were lost to follow up at 1 year. No differences in mortality between the groups were observed, and there were no differences in readmission rates.

Table 5 details the principle services used during the study period. While differences in the distribution of provision of inpatient and outpatient therapy are shown, the total therapy provided did not differ significantly between the groups.

Discussion

To our knowledge, this is the first randomised controlled trial of early discharge of patients with stroke to a team of therapists in the community. The trial was conducted in an inner city district, and the findings should be applicable to other cities. The study sample represented about half of the patients with stroke admitted over the study period and three quarters of the patients with stroke who did not die in hospital. The pragmatic design of the trial with simple entry criteria and recruitment from two hospitals with patients on a range of types of ward makes it likely that the results are generalisable to other units. Assessment of outcome at discharge from hospital indicated no significant differences, although the length of stay after randomisation to the community therapy arm was significantly shorter.

Methodological considerations

One year outcome measures support the notion that early discharge to a rehabilitation team in the community has no adverse effect on outcome. The Barthel score is the most widely used measure in stroke rehabilitation trials and was used in this study because

Table 4 Numbers (percentages) of patients with stroke who were eligible and followed up, according to place of rehabilitation

Detail	Community therapy (n=167)	Conventional (n=164)	P value (χ^2 test)	95% CI for % difference between groups
Dead by 12 months	26 (16)	34 (21)	0.22	(–13 to 3)
Followed up at 12 months alive	136 (81)	126 (77)	0.83	(–2 to 16)
Lost to follow up	5 (3)	4 (2)	0.83	(–3 to 4)
Stroke recurrence	10 (6)	5 (3)	0.20	(–2 to 7)
Readmitted to hospital	44 (26)	42 (26)	0.20	(–9 to 10)

of the importance of longer term disability. It could be argued that the intervention was more likely to affect the Rivermead at one year. A post hoc power calculation for the Rivermead activities of daily living score, with about a quarter of patients scoring the minimum score (15) at 1 year, showed a power of 80% to detect more than 41% or less than 12% of the early discharge group scoring 15. Satisfaction with care was not significantly different between the two groups from the perspectives of carers or patients, although patients in the community therapy group were more satisfied with the care provided in the hospital. The longer patients stay in hospital the more chance they have of being exposed to aspects of care that dissatisfy them. Alternatively the higher dissatisfaction among the patients receiving conventional care reflected the fact that they were exposed to a rehabilitation philosophy within the context of an acute hospital. Patients may expect to be cared for by nurses and not to be encouraged to independence, while at home the need for independence may be more evident.

The overall survival rates were similar in both groups, and early discharge did not result in greater rates of institutionalisation or hospital readmission. Although the total therapy for each discipline provided was not significantly different between the two groups for those having therapy, provision of therapy for patients with an impairment was better in the patients treated in the community, possibly reflecting better assessment and team working.

Nine patients (2.7%) were lost to follow up at 1 year, mainly because they had left the country. Completion rates for the outcome assessments were low because of a combination of cognitive and language problems in the study population but were similar to those achieved in a comparable group of patients with stroke.[16] A considerable proportion of the patients (26%) were living alone at 1 year and were without a principal carer able to give information. Completion rates for the scales and follow up rates were not significantly different between the two groups and are unlikely to have affected the final results.

Table 5 Resources used by patients with stroke over 12 month trial period according to place of rehabilitation

Detail	Community therapy (n=167)	Conventional (n=164)	P value	95% CI for difference between groups†
Length of stay from randomisation				
Mean (SD)	12 (19)	18 (24)		
Median (range)	6 (0-149)	12 (0-236)	0.0001*	(–6 to –2)
Not known	2	1		
Total No of bed days (from randomisation)	1956	2854		
Physiotherapy units†				
No (%) with motor deficit	151 (90)	144 (88)		
No (%) having inpatient physiotherapy	121 (80)	111 (77)	0.52‡	(–6% to 12%)
Mean units (SD)	10.8 (14.3)	17.3 (23.8)		
Median units (range)	6 (1-107)	10 (1-153)	0.01*	(–4 to 0)
Total inpatient units§	1309	1923		
No (%) having outpatient physiotherapy	114 (75)	28 (19)	0.001‡	(45% to 67%)
Mean units (SD)	21 (24)	18 (18)		
Median (range)	11 (1-140)	10 (1-74)	0.998*	(–4 to 5)
Total outpatient units	2387	496		
Median total therapy (range)	14 (1-156)	12 (1-153)	0.07*	(0 to 6)
Occupational therapy units†				
No (%) with functional deficit	151 (90)	144 (88)		
No (%) having inpatient occupational therapy	97 (64)	104 (72)	0.14‡	(–19% to 3%)
Mean (SD)	9 (10)	22 (21)		
Median (range)	8 (1-74)	17 (1-105)	0.0001*	(–12 to –5)
Total inpatient units§	916	2292		
No (%) having outpatient occupational therapy	125 (83)	15 (10)	0.001	(61% to 84%)
Mean units (SD)	22 (24)	33 (35)		
Median (range)	12 (2-156)	15 (3-119)	0.19*	(–18 to 2)
Total outpatient units	2740	498		
Median total therapy (range)	17 (2-156)	18 (1-223)	0.43*	(–2 to 5)
Speech therapy units†				
No (%) with functional deficits (speech/swallowing)	119 (71)	113 (69)		
No (%) having inpatient speech therapy	42 (35)	35 (31)	0.46‡	(–8% to 16%)
Mean (SD)	8 (8)	14 (13)		
Median (range)	5 (1-47)	9 (1-64)	0.009*	(–7 to –1)
Total inpatient units§	319	491		
No (%) having outpatient speech therapy	64 (54)	8 (7)	0.001	(35% to 59%)
Mean units (SD)	21 (22)	17 (29)		
Median (range)	13 (1-90)	6 (2-89)	0.29*	(–3 to 15)
Total outpatient units	1327	139		
Median total therapy (range)	15 (1-100)	9 (1-89)	0.11*	(–1 to 9)
No (%) according to living conditions at 1 year				
No of patients	135	126	0.27‡	
Alone	37 (27)	31 (25)		
With others	84 (62)	70 (56)		
Sheltered accomodation	6 (4)	8 (6)		
Institution	8 (6)	15 (12)		
In hospital	0	2 (2)		
No (%) using home help				
Yes	46 (34)	47 (37)	0.45‡	(–15% to 8%)
Not known	2	0		
No (%) using meals on wheels				
Yes	17 (12)	14 (12)	0.79‡	(–7% to 9%)
Not known	2	4		

*Mann-Whitney test. †One unit of therapy=20 minutes of therapist's time. ‡χ^2 test. §Inpatient therapy units=therapy given between randomisation and discharge.

Comparison with other studies

Early discharge schemes have been developed for surgical patients after caesarean section,[13] varicose vein and hernia operations,[14 15] and myocardial infarction.[16] The effects on outcome in these studies were small. Augmented support hospital discharge teams[17 18] reduce readmissions to hospital of elderly patients, thereby saving hospital resources. The overall conclusion of Clarke's literature review was that with the very limited evidence reductions in length of stay have not had a major effect on health outcome,[19] although the outcomes measured may not have been relevant to the intervention.

It has been argued that admission to hospital at all for patients with stroke is unnecessary except for a small proportion of patients.[20] This is not the view taken by a WHO consensus meeting[21] and is clearly not believed by most of the general practitioners who admitted up to 70% of their patients in London.[2] The only non-randomised trial to provide intensive domiciliary rehabilitation as an alternative to hospital admission for stroke failed to reduce admission rates.[22] Pound et al found that patients with stroke have important psychosocial needs during the acute stage of stroke that are often met by hospital admission.[23]

Conclusions

Provision of a specialist team of therapists led by a consultant provides a model of care for patients with stroke which is as effective as conventional hospital

Key messages

- Early discharge from hospital after stroke with specialist rehabilitation at home is feasible without an increase in readmission rates or stress to carers
- This randomised controlled trial shows this method to be as effective as conventional care when assessed with a range of measures of impairment, disability, handicap, carer stress, and patient and carer satisfaction at 1 year
- Significant reductions in bed usage can be achieved by the provision of a community rehabilitation team with no significant increase in rehabilitation services

based care, with a significant reduction in hospital stay. As the numbers of patients with stroke increase with the aging population the only alternative to building more acute hospitals may be to develop alternative community based specialist care.

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An experience that shaped my career

My first diagnosis

At the time of my 10th birthday in November 1933 my mother was "unwell." Of course I did not fully appreciate this. She was not confined to bed and was going about her day apparently normally, although under the care of her general practitioner. One night in February 1934 my father went to visit his brother who lived four miles away. There was no reason why he should stay at home with us.

About 9 15 pm I was getting into bed and my mother was just outside my bedroom. Suddenly I heard her say "I do feel ill." I got out of bed, went to her, and, for reasons which will become obvious, the next few minutes were rather blurred. But I do remember, with absolute clarity, rushing down the stairs in my pyjamas, going next door, knocking furiously, and saying, "Come quickly, my mother is dying."

Why did I—a 10 year old—say that? The neighbour and I went back to where my mother lay on the floor—either deeply unconscious or, more probably, already dead. Thus I had made my first diagnosis. I had said my mother was dying and I was correct.

How did I know? No one had told me that my mother might die. My father did not expect it—he was shocked on his return an hour later. But I knew when I rushed down those stairs to get help. But even now I still do not know how I realised that she was dying.

What else do I remember of that night? As I lay in my neighbour's house I heard the signature tune of *In Town Tonight*, the radio programme. It was the *Knightsbridge* march by Eric Coates. Whenever I hear that music, I think of that night.

My father and I drew even closer and he was my counsellor. Later that year we went to London and stayed with my mother's cousins, and went to the first day of the England and Australia test at the Oval. I saw Bradman score 244 in a second wicket partnership of 451 (still a world record). But even this brought back a memory, for three years previously my mother had taken me to Lord's to see Yorkshire playing Middlesex. My hero, Herbert Sutcliffe, scored 120, and I still have the score card with my mother's writing on it to bring back the memory of our day together.

What other memories do I have left these 63 years later and 52 years after graduating? Firstly, a physical memento—my mother's Royal Red Cross, awarded to her in 1918 for her services to the wounded as a surgical ward sister at Edinburgh Royal Infirmary. Among the wounded was my father, who arrived in her ward by courtesy of a German shell at Passchendaele. Secondly, a hope that she as a nurse would have been proud of my medical career, which I have always felt began with that correct diagnosis in 1934.

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